



The UpWind Special Issue

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EDITORIAL

The UpWind Special Issue

The UpWind integrated project, co-funded by the European Commission, was a unique collaboration between 40 partners from European industry, research community, academia and government focused on a single arching theme—design issues associated with large multi-megawatt wind turbines. The vision was a bold one, i.e. to enable a paradigm shift in the perspective of the wind energy industry encompassing design issues for every aspect of future large wind turbines, including modeling tools, and covering components from design for reliability through to manufacturing to reduce costs. For all the multifaceted parts of the project to be integrated, the structure incorporated a number of scientific and technological work packages with cross-cutting work packages that combined new ideas and techniques across a range of issues (Figure 1).

In addition to the comprehensive overview of the project results that is available,¹ this special issue presents some highlights of the research and integration activities that were undertaken in more detail. We start with a paper of Sieros *et al.*,² which is one of the cornerstones of the project objectives addressing the perennial question ‘How large can wind turbines get?’ in an economic framework. The concept of UpScaling was tackled in almost all aspect of the project and is a theme running through the papers. A technology integration framework was used in Mueller *et al.*³ to examine the structural optimization of different transverse flux permanent magnet generator configurations. In the area of aerodynamics and aero-elastics, a comprehensive analysis of aero-acoustic modeling was performed in Kamruzzaman *et al.*,⁴ whereas to model the aerodynamics of a megawatt rotor with complex inflow such as shear and wake interaction, a full local blade element model implementation for an elemental stream tube in both azimuth and radial direction should be used.⁵ Another crucial issue to large turbine design—testing and modeling of materials—is reviewed in the paper of Mishnaevsky *et al.*⁶ An integrated design process for offshore support structures that takes turbine controls actively into account to enable cost-effective designs is presented in Fischer *et al.*⁷ The importance of control for multi-megawatt turbines is also illustrated in Bossanyi *et al.*⁸ Moving on from the turbines themselves to the atmosphere, a verification procedure for traceable inflow measurements using Doppler lidar is described in Gottschall *et al.*⁹ Arrays of

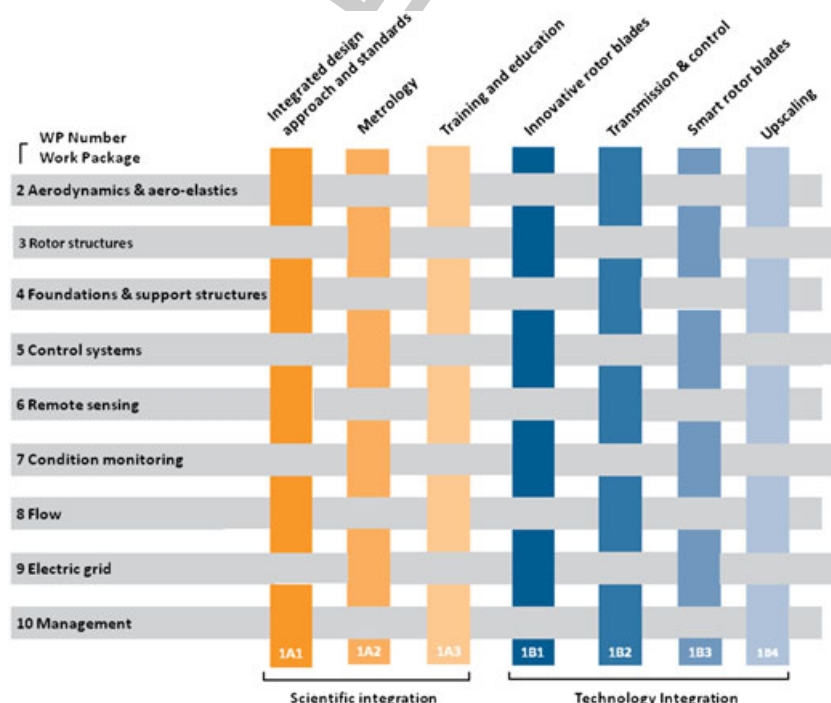


Figure 1. The structure of the European Union project UpWind (Figure redrawn from Fichaux *et al.*¹)

large turbines in two environments—complex terrain and offshore—are considered in the last two papers. An assessment of the state of the art of modeling wind farms in complex terrain is presented in Politis *et al.*,¹⁰ whereas Hansen *et al.*¹¹ use data from large offshore wind farms to explore the relationship between the atmospheric conditions and the power output from large offshore wind farms. Each of these papers is a major contribution to the overall thrust of the project moving wind energy forward by integrating and optimizing materials, models, tools, techniques and evaluation procedures to develop the most efficient and reliable wind turbines and wind farms.

We are dedicating this UpWind Special Issue to Sten T. Frandsen who was instrumental in the development of many of the scientific and technical ideas as well as the organizational structure of the project. Sadly, Sten passed away in October 2010 as the project reached its successful completion. Sten spent most of his career in the Wind Energy Department at Risø National Laboratory, Denmark and was well known for his manifold contributions to wind energy research, design criteria for offshore wind turbines and development of new approaches to standards. We recognize our friend and colleague Sten T. Frandsen for his enduring legacy in wind energy research, innovation and implementation.

We thank all the Wind Energy editors for their help in putting together this special issue and also to Peter Hjuler Jensen of Risø DTU National Laboratory for Sustainable Energy and Jos Beurkens of the Energy Center of the Netherlands who coordinated the UpWind project.

REFERENCES

1. Fichaux N, Beurskens J, Jensen PH, Wilkes P. UpWind. Design limits and solutions for very large wind turbines. A 20 MW turbine is feasible, 2011. European Wind Energy Association: <http://www.ewea.org/fileadmin/ewe documents/documents/upwind/21895UpWindReportlowweb.pdf>. Brussels. p. 108.
2. Sieros G, Chaviaropoulos P, Sorensen J, Bulder B, Jamieson P. *Wind Energy* 2011. In press.
3. Mueller M, Zavvos A, Bang D-J, McDonald A, Polinder H. Structural analysis & optimisation of transverse flux permanent magnet machines for direct drive wind turbines. *Wind Energy* 2011. In press.
4. Kamruzzaman M, Lutz T, Wuerz W, Shen WZ, Zhu WJ, Hansen MOL, Bertagnolio F, Madsen HA. Validations and improvements of aeroacoustic models using detailed experimental data. *Wind Energy* 2011. In press.
5. Madsen HA, Riziotis V, Zahle F, Hansen MOL, Snel H, Grasso F, Larsen TJ, Politis E, Rasmussen F. Blade element momentum modeling of inflow with shear in comparison with advanced model results. *Wind Energy* 2011. DOI: 10.1002/we.493, (to appear in print).
6. Mishnaevsky Jr L, Brøndsted P, Nijssen R, Lekou DJ, Philippidis TP. Materials of large wind turbine blades: recent results in testing and modeling. *Wind Energy* 2011. DOI: 10.1002/we.470, (to appear in print).
7. Fischer T, de Vries W, Rainey P, Schmidt B, Argyriadis K, Kuehn M. Offshore Support Structure Optimization by means of Integrated Design and Controls. *Wind Energy* 2011. In press.
8. Bossanyi E, Savini B, Iribas M, Hau M, Jasiewicz B, Schlipf D, van Engelen T, Rossetti M, Carcangiu C-E, Sanchez J, Mata M. Advanced controller research for multi-MW wind turbines. *Wind Energy* 2011. In press.
9. Gottschall J, Wagner R, Courtney M, Jørgensen HE, Antoniou I. Lidar profilers in the context of wind energy—a verification procedure for traceable measurements. *Wind Energy* 2011. In press.
10. Politis E, Prospathopoulos J, Cabezón D, Hansen K, Chaviaropoulos P, Barthelmie R. Modelling wake effects in large wind farms in complex terrain: the problem, the methods and the issues. *Wind Energy* 2011. DOI: 10.1002/we.481, (to appear in print).
11. Hansen KH, Barthelmie RJ, Jensen LE, Sommer A. The impact of turbulence intensity and atmospheric stability on power deficits due to wind turbine wakes at Horns Rev wind farm. *Wind Energy* 2011. In press. WE-10-0149.

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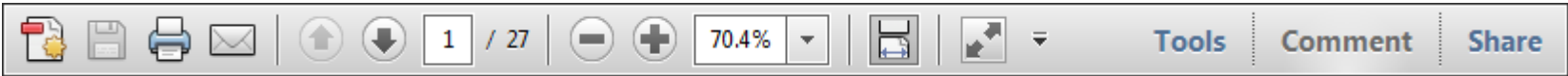
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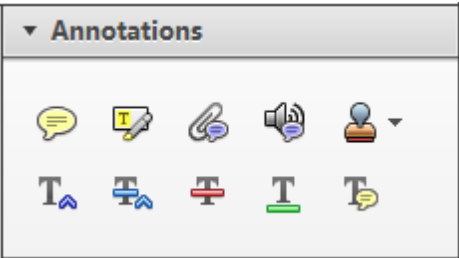
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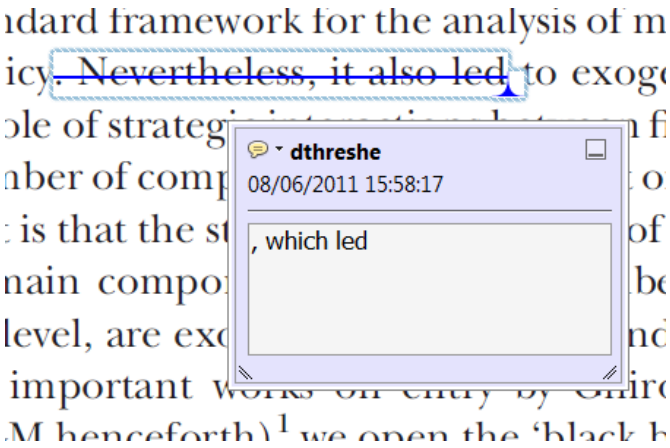
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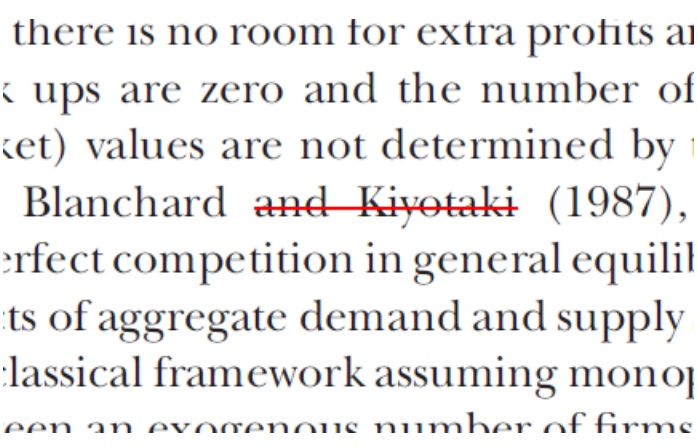
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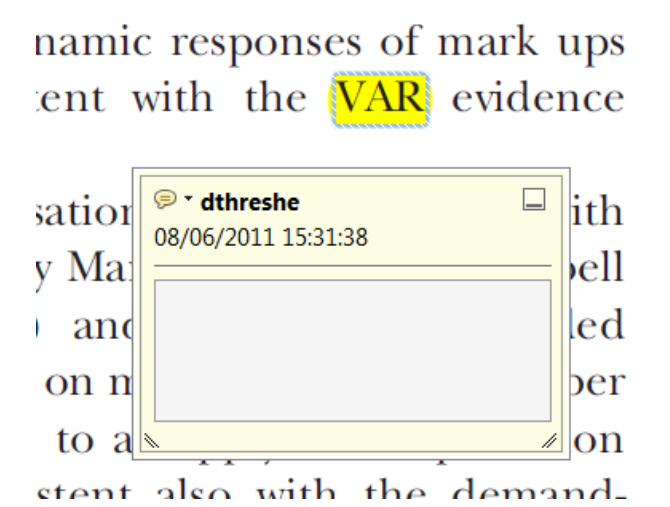
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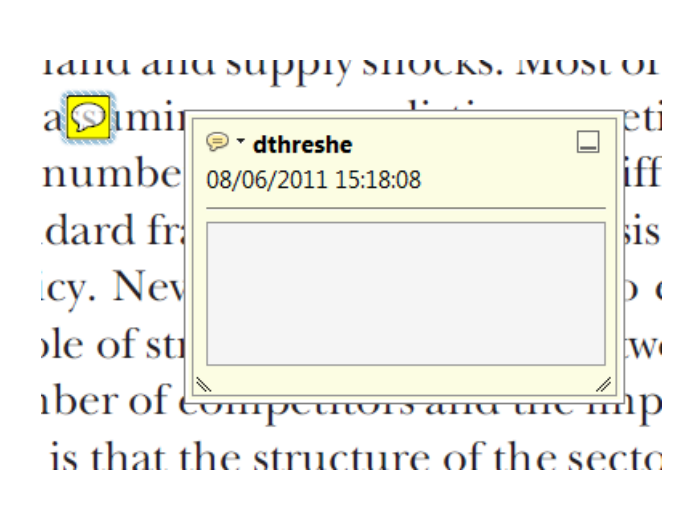
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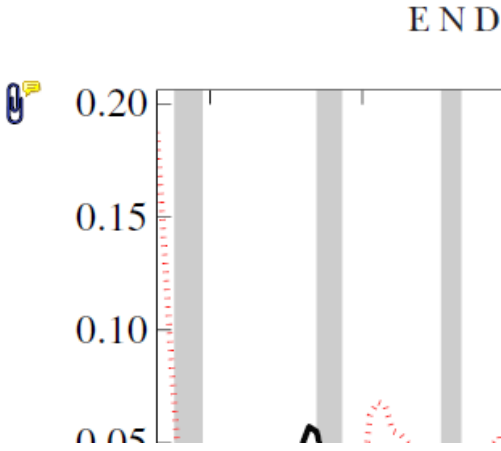
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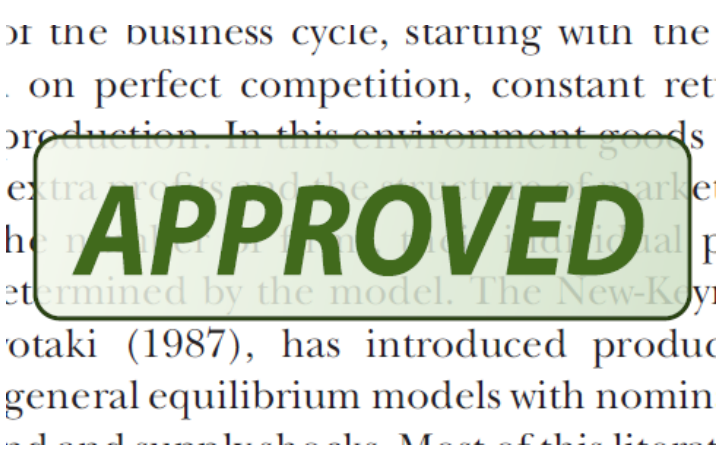
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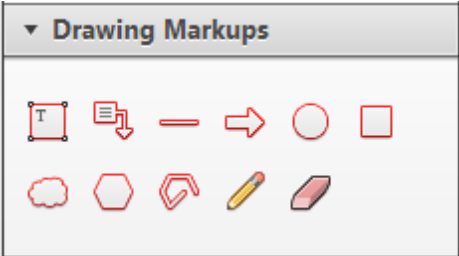
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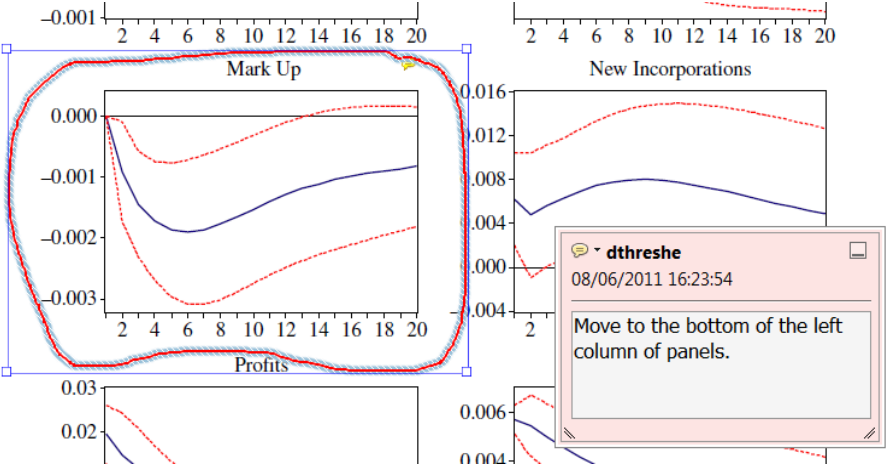
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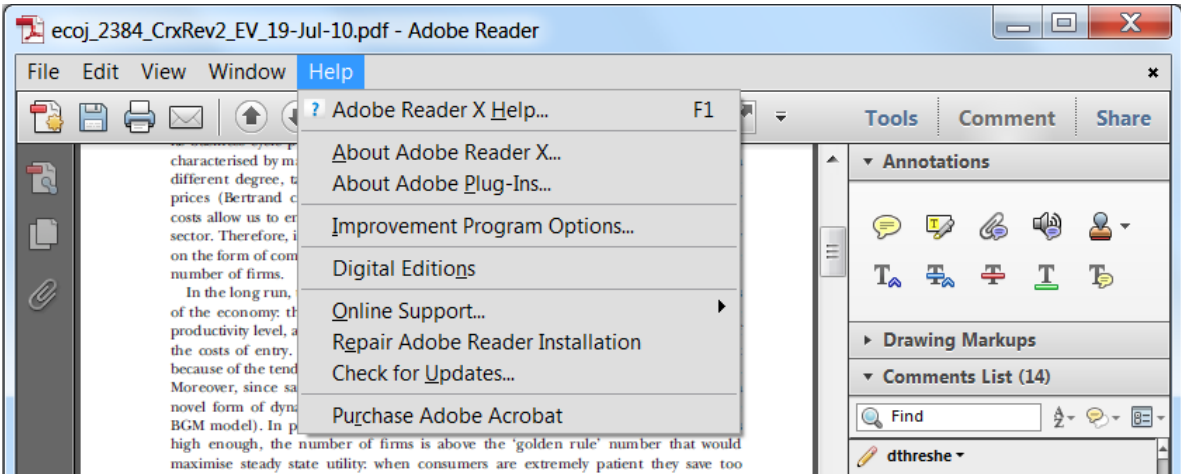


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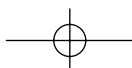
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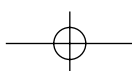
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